3-28-2014

Buying Wins: the Role of Salary in on Field Success in the MLB and NFL

Jake Bredemeyer
Indiana University - Purdue University Fort Wayne

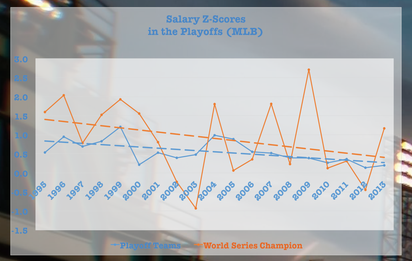
Buying Wins:
The role of salary in on field success in the MLB and NFL

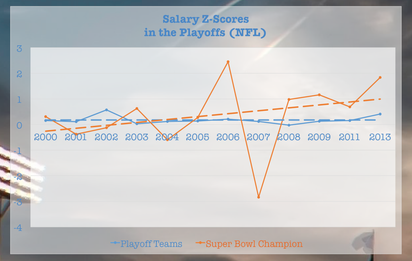
Many sports purists maintain that in order to win, teams must have the right components, chemistry, leadership, and timing. Simply paying the best players the most money should not guarantee a championship, right? While having the right players with good chemistry certainly is important, what is the actual impact a team's salary has on its success? This research attempts to answer that question and what effects different salary regulations have on competitive balance in Major League Baseball (MLB) and the National Football League (NFL).

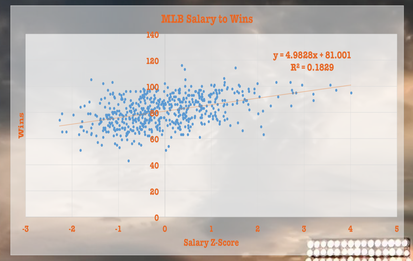
Hypothesis 1:
There will be a significant positive relationship between salary and regular season wins but not championships.

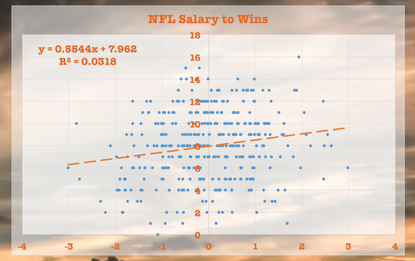
Hypothesis 2:
There will be a higher relationship between salary and wins in the MLB, which has no salary cap, than in the NFL, which has a hard salary cap.

Hypothesis 3:
Having a hard salary cap does increase parity among teams versus no salary cap.







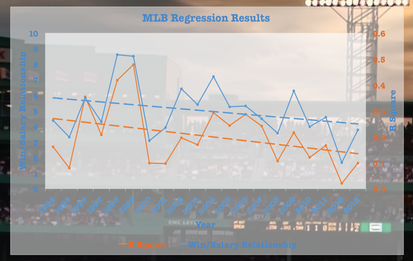


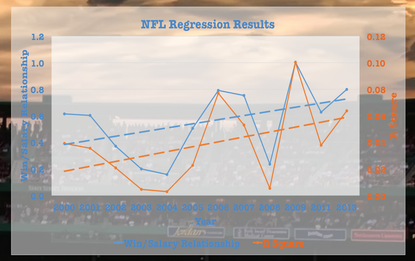
MLB Playoff Results

Year	Avg. Salary Z-Score	Salary Z-score WS
1995	0.5351	1.5944
1996	0.9474	2.0373
1997	0.6942	0.7869
1998	0.8311	1.5220
1999	1.2068	1.9292
2000	0.2132	1.5556
2001	0.5328	0.8056
2002	0.3969	-0.2372
2003	0.4789	-0.9295
2004	0.9877	1.8052
2005	0.8870	0.0628
2006	0.5546	0.3572
2007	0.5173	1.8139
2008	0.3934	0.2339
2009	0.3904	2.7067
2010	0.2632	0.1230
2011	0.3619	0.3126
2012	0.1336	-0.4431
2013	0.2002	1.1695
Min	0.1336	-0.9295
Max	1.2068	2.7067
Mean	0.5540	0.9056
St. Dev.	0.2982	0.9859

NFL Playoff Results

Year	Avg. Salary Z-Score	Salary Z-score SB
2000	0.1552	0.3106
2001	0.1062	-0.3767
2002	0.5731	-0.1238
2003	0.0290	0.6232
2004	0.1171	-0.5935
2005	0.1402	0.2773
2006	0.2109	2.4519
2007	0.1147	-2.8365
2008	-0.0246	0.9803
2009	0.1313	1.1570
2011	0.1599	0.6906
2013	0.4119	1.8369
Min	-0.0246	-2.8365
Max	0.5731	2.4519
Mean	0.1771	0.3664
St. Dev.	0.1631	1.3372





A regression analysis of wins in a season and team salary was done in order to test Hypothesis 2. If we multiply NFL wins by 10, in order to account for the variation in games played, we see that the coefficient in the NFL regression equation is higher. In the NFL 1 St. Dev. from the mean is worth about half of a win (5.5 MLB wins), in the MLB 1 St. Dev. from the mean is worth 4.98 wins. We can see that the regression line fits the MLB data much better than the NFL line which is demonstrated with a higher R-square figure. This is also demonstrated by the analysis being statistically significant for most years in the MLB but not the NFL. This suggest that there is much more that predicts wins in the NFL than the MLB.

Team	Avg.Wins	Playoff App.	World Series Wins
Arizona Diamondbacks	80.85	4	1
Atlanta Braves	93.30	13	1
Baltimore Orioles	76.25	3	0
Boston Red Sox	89.35	10	3
Chicago Cubs	76.65	4	0
Chicago White Sox	83.25	3	1
Cincinnati Reds	81.40	3	0
Cleveland Indians	85.20	7	0
Colorado Rockies	76.90	3	0
Detroit Tigers	74.75	4	0
Houston Astros	80.70	6	0
Kansas City Royals	70.75	0	0
Los Angeles Angels	84.80	6	1
Los Angeles Dodgers	85.50	7	0
Miami Marlins	76.55	2	2
Milwaukee Brewers	76.25	2	0
Minnesota Twins	78.50	6	0
New York Mets	81.00	3	0
New York Yankees	96.30	17	5
Oakland Athletics	84.30	7	0
Philadelphia Phillies	82.20	5	1
Pittsburgh Pirates	71.10	1	0
San Diego Padres	78.25	4	0
San Francisco Giants	84.40	6	2
Seattle Mariners	80.05	4	0
Saint Louis Cardinals	86.55	11	2
Tampa Bay Rays	74.69	4	0
Texas Rangers	82.21	5	0
Toronto Blue Jays	79.26	0	0
Washington Nationals/ Montreal Expos	75.58	1	0
Min	71.10	0	0
Max	96.30	17	5
Mean	81.24	5.42	0.83
St. Dev.	6.52	4.70	1.83

Team	AvgWins	Playoff App.	Superbowl Wins
Arizona Cardinals	6.35	3	0
Atlanta Falcons	8.00	8	0
Baltimore Ravens/ Cleveland Browns	8.70	10	2
Buffalo Bills	7.10	4	0
Carolina Panthers	7.58	5	0
Chicago Bears	7.85	5	0
Cincinatti Bengals	6.70	5	0
Cleveland Browns	8.13	1	0
Dallas Cowboys	8.50	9	1
Denver Broncos	8.95	10	2
Detroit Lions	6.75	5	0
Green Bay Packers	10.20	15	2
Houston Texans	6.58	1	0
Indianapolis Colts	9.70	14	1
Jacksonville Jaguars	7.58	6	0
Kansas City Chiefs	8.00	6	0
Miami Dolphins	8.10	8	0
Minnesota Vikings	8.45	10	0
New England Patriots	10.85	14	3
New Orleans Saints	7.85	6	1
New York Giants	8.40	8	2
New York Jets	7.60	7	0
Oakland Raiders	6.50	3	0
Philadelphia Eagles	8.80	12	0
Pittsburgh Steelers	10.80	12	2
San Diego Chargers	8.15	7	0
San Francisco 49ers	8.75	10	1
Seattle Seahawks	8.30	9	1
Saint Louis Rams	6.65	5	1
Tampa Bay Buccaneers	7.60	7	1
Tennessee Titans/ Houston Oilers	8.25	6	0
Washington Redskins	6.80	4	0
Min	6.13	1	0
Max	10.85	15	3
Mean	7.94	7.34	0.63
St. Dev.	1.28	3.60	0.87

In order to test Hypothesis 1, salary data was collected from USAToday and standardized by converting salaries into z-scores. Next playoff results were collected from baseball-reference.com and profootball-reference.com. From the results we can determine that salary has a positive impact on making the playoffs, which is determined by regular season success, in both leagues. The average z-score of both league's playoff teams were consistently positive. The league champions had a higher average z-score than the playoff average which suggests that a higher correlation, however they St. Dev. were much higher suggesting a higher degree of variation.

In order to test Hypothesis 3, we can look at the St. Dev. of average wins, playoff appearances, and championships. Again we should remember to account for games played (MLB-162, NFL-16) so wins should be mulitiplied by 10. When that is done St. Dev. of Average wins is about 10 MLB games 4 games higher than MLB. However St. Devs. for playoff appearances and championships are much higher in the MLB than the NFL. These results suggest that in the MLB, without a salary cap, regular season wins are more evenly distributed than in the NFL, with a hard salary cap. However playoff success is higher concentrated in a few teams in the MLB rather than the NFL which has playoff appearances and Super Bowls more evenly distributed.